

Serial No. 10/063,189

RD-29310

REMARKS

Applicant has carefully considered the Office Action mailed on February 04, 2005. In response to the office action, Applicant amended claims 1, 8, 13 and 18 and canceled claims 7, 12 and 17. Claims 1-6, 8-11, 13-16 and 18-20 are pending in the present patent application. No new matter has been added. In view of the above amendments and the following remarks, Applicant requests further examination and reconsideration of the present patent application.

The Examiner rejected claims 1, 3-7, 13 and 15-19 under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US 4,297,034, hereinafter Ito), in view of Beaty et al. (US 6,072,898, hereinafter Beaty). Applicant respectfully traverses the rejection of claims 1, 3-7, 13 and 15-19 under 35 USC 103(a) over Ito in view of Beaty. It is respectfully submitted that the Applicant's invention as recited in independent claims 1, 13 and 18 and claims depending therefrom, is not obvious in view of the applied references, taken individually or in combination. Applicant further submits that the applied references fail to teach or suggest means for using the location of the edge of the part in a co-ordinate system to locate other surface features of the part and compute surface feature information for the part, wherein computing the surface feature information for the part determines acceptability of the part as recited in independent claims 1, 13 and 18.

Applicant respectfully submits that the applied references do not teach, suggest, or disclose (either individually or collectively) the independent claims 1, 13 and 18 recitation of "using the location of the edge of the part in a co-ordinate system to locate other surface features of the part and compute surface feature information for the part, wherein computing the surface feature information for the part determines acceptability of the part". Ito merely discloses an apparatus for measuring contour configuration or dimensions of articles in a rapid and accurate manner without touching the articles. The apparatus disclosed in Ito measures the outer configuration, in particular, the height of the article. Ito does not disclose means for using the location of the edge of the part in a co-ordinate system to locate other surface features of the part and compute surface feature information for the part, wherein computing the surface feature information for the part determines acceptability of the part.

Further, there is no motivation in Ito to combine it with Beaty. Beaty does not overcome the deficiencies of Ito. Beaty discloses a method and apparatus for three dimensional inspection of solder balls on ball grid arrays and solder bumps on wafer and die. Beaty also does not disclose means for using the location of the edge of the part in a co-ordinate system to locate

Serial No. 10/063,189

RD-29310

other surface features of the part and compute surface feature information for the part, wherein computing the surface feature information for the part determines acceptability of the part. The Examiner contended that finding dimensions of the Ball Grid Array (BGA) as disclosed in Beaty was similar to a means for locating surface features of the part as disclosed in the present patent application. However, Applicant points out that Beaty does not disclose means for locating surface features of the part as contented by the Examiner. Instead, Beaty merely indicates that the three dimensional inspection of the elements of the BGA may be carried out in the X, Y and Z dimensions using a triangulation technique.

Therefore, Applicant respectfully submits Ito and Beaty, either alone or in combination, do not disclose, teach or suggest means for using the location of the edge of the part in a co-ordinate system to locate other surface features of the part and compute surface feature information for the part, wherein computing the surface feature information for the part determines acceptability of the part.

Thus, no reasonable combination of Ito and Beaty would obtain Applicant's claimed invention of a method for locating an edge of a part for acceptance testing of the part using a structured light system, wherein the method comprises using the location of the edge of the part in a co-ordinate system to locate other surface features of the part and compute surface feature information for the part, and wherein computing the surface feature information for the part determines acceptability of the part.

Accordingly, Applicant respectfully submits that the claimed invention, as recited in claims 1, 13 and 18 defines allowable subject matter over the applied art. Claims 3-6, 15-16 and 19 depend directly or indirectly from independent claims 1, 13 and 18 respectively. Accordingly, Applicant submits that claims 3-6, 15-16 and 19 are allowable by dependency. Thus, it is respectfully requested that the rejection of claims 1, 3-6, 13 and 15-16 and 19 under 35 USC 103(a) be withdrawn.

The Examiner rejected claims 2, 8-12, 14 and 20 under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Beaty and further in view of Sugiura et al.(US 6,034, 766, hereinafter Sugiura). As discussed above with reference to Ito and Beaty, Applicant submits no reasonable combination of Ito and Beaty would obtain Applicant's recited invention. Applicant further submits that Sugiura does not overcome the deficiencies of Ito and Beaty. Sugiura

Serial No. 10/063,189

RD-29310

discloses an optical member inspection apparatus for detecting an optical defect of an inspection target optical member. Therefore, Ito and Beaty (either alone or in combination with Sugiyura) do not disclose, teach or suggest means for "using the location of the edge of the part in a coordinate system to locate other surface features of the part and compute surface feature information for the part, wherein computing the surface feature information for the part determines acceptability of the part". Further, nowhere do the Ito, Beaty or Sugiyura references show or suggest that the located edge of the part is used to compute surface feature information for the part, wherein computing the surface feature information for the part determines acceptability of the part. Therefore Applicant respectfully submits there is no reasonable motivation or suggestion to combine the applied references.

Accordingly, Applicant respectfully submits that the claimed invention, as recited in claim 8 defines allowable subject matter over the applied art. Claims 2, 9-11, 14 and 20 depend directly or indirectly from independent claims 1, 8, 13 and 18 respectively. Accordingly, Applicant submits that claims 2, 9-11, 14 and 20 are allowable by dependency. Thus, it is respectfully requested that the rejection of claims 2, 8-11, 14 and 20 under 35 USC 103 (a) be withdrawn.

Obviousness cannot be established absent a teaching or suggestion in the prior art to produce the claimed invention. For a *prima facie* case of obviousness, the Examiner must set forth the differences in the claim over the applied references, set forth the proposed modification of the references, which would be necessary to arrive at the claimed subject matter, and explain why the proposed modification would be obvious. It is well-established law that the mere fact that references may be combined or modified does not render the resultant modification or combination obvious unless the prior art suggests the desirability of the modification or combination. As stated above, nowhere do the applied references teach, suggest or disclose means for computing surface feature information for the part using the location of the edge of the part to determine acceptability of the part. In the present patent application, the detected edge locations provide boundaries by which surface feature information can be compared to CAD data or other data by which acceptability of the part is determined.

Applicant interprets the Office Action as stating the proposed modification is to combine Ito and Beaty to obtain a system that uses a diffuse light source to enhance the contour of the part and to locate the edge in three dimensions to be able to measure the contours precisely and to

Serial No. 10/063,189

RD-29310

further combine the teachings of Sugiura within the method taught by Ito and Beaty to use a white light source to illuminate the object.

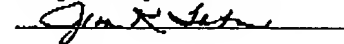
However, Applicant respectfully submits that nowhere do the applied references disclose a technique for determining surface feature information from the located edges and using the surface feature information to determine acceptability of a part. Further the applied references merely address techniques for measuring contour configuration of articles, detecting optical defects and performing three dimensional inspection of parts.

Thus, Applicant submits that the Examiner has failed to provide a basis in the art for combining the applied references that would support a prima facie case of obviousness. Accordingly, Applicant respectfully submits that the claimed invention, as recited in now presumably allowable independent claims 1, 8, 13 and 18 define allowable subject matter over the applied art. Withdrawal of the rejections is respectfully requested, and allowance of claims 1, 8, 13 and 18 is respectfully solicited. Claims 2-6, 9-11, 14-16 and 19-20 depend directly or indirectly from claims 1, 8, 13 and 18 and are therefore similarly patentable by dependency.

In view of the foregoing amendment and for the reasons set out above, Applicant respectfully submits that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested.

Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact Applicant's undersigned representative at the telephone number below.

Respectfully submitted,



Jean Testa
Reg. No. 39,396

May 3, 2005
General Electric Company
Building K1, Room 3A62
Schenectady, New York 12301
Telephone: (518) 387-5115
Fax: (518) 387-7751